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ABSTRACT

This document contains the following papers on preservice, inservice, graduate, and faculty use of telecommunications from the SITE (Society for Information Technology & Teacher Education) 2002 conference: (1) "Alternative Classroom Observation through Two-Way Audio/Video Conferencing Systems" (Phyllis K. Adcock and William Austin); (2) "Looking into Classrooms: A Technology Mediated Observation Program for Preservice Teachers" (Judith A. Boccia, Patricia L. Fontaine, F. Michael Lucas); (3) "Video Conferencing as a Tool To Link Colleges of Education with K-12 Schools: A P3T3 Project Initiative" (James D. Lehman and Rabih Razouk); (4) "In Their Own Words: Pre-Service Teachers' Perceptions of ICT Integration" (Petrea Redmond and Peter Albion); (5) "Improving Experiment Project Evaluation through Web-Based Self- and Peer Assessment" (Yao-Ting Sung, Chen-Shan Lin, Chee-Lung Lee Kuo-En Chang); (6) "A Comparison to Two Types of Electronic Communication in an Undergraduate Teacher Education Course" (Melissa A. Thomeczek); and (7) "The Collaboratory in Your Program" (Bonnie Thurber and Bob Davis). Brief summaries of conference presentations on a video conference virtual field trip and helping students pass PRAXIS I are also included. Most papers contain references. (MES)

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Telecommunications: Preservice, Inservice, Graduate, and Faculty (SITE 2002 Section)

Sue Espinoza. Ed.

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SECTION EDITOR:
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Telecommunications and education – the two are becoming increasingly intertwined in our classrooms and programs at all levels, especially in teacher education programs that are preparing educators to effectively use these technologies in their classrooms. The range of applicable technologies is growing as new ones are emerging and current ones are expanding. The number of schools with Internet-connected computers in libraries, labs, and classrooms continues to grow, providing potential opportunities for students and teachers to participate in global learning communities, and to both retrieve and produce educational resources. Teachers must learn to use and feel comfortable with these technologies, as tools to enhance teaching and learning. So where and how does this take place? The papers in this section demonstrate the wide range of approaches, for both preservice and inservice teachers, in university, field-based, and alternative programs, with delivery 'sites' being online (Internet), videoconferencing, university classrooms, or k-12 schools – either individually or in combination.

Both video-conferencing and online Internet-based courses are described, as are uses of these technologies as integral components of classroom-based courses and/or faculty development. Also discussed are general support and community resources that are not course-connected, and that speak to the concept of lifelong learning. Taken as a whole, these papers provide a snapshot of ways that telecommunications can be used to support and promote effective teaching and learning in today's educational settings. Accounts of both successes and lessons-learned, as well as discussion of methods of assessment of the use and/or effectiveness of various technologies provide guidance for current and future educators.

The Internet may be a veritable goldmine of resources, or it can be an endless maze through which educators wander in a fruitless quest for those resources. Growing numbers of portals and other methods of organizing Internet resources are appearing. Levin and Grotto introduce one such effort – discussing how resources are selected and evaluated for inclusion in a database, and how teachers can become a part of that process. In addition to finding resources, the Internet also provides a forum in which educators can share resources they have created, thus contributing to others in their profession. Repman, Carlson, and Downs describe and provide links to a number of web-based tools that they have found helpful for productivity and instruction. Gersh, also explores web-based tools, discussing those that facilitate "Internetized" lessons and internet-based projects. Specialized applications provide opportunities such as the use of remote scientific instrumentation technology in K-12 and teacher education classrooms, as described by Thakkar, et al. This use of Internet-based activities is basic to the world of telecommunications for classroom instruction, and opportunities to learn more are often available at universities and colleges, as well as at school districts.

E-mail has become almost as common, if not more so, than the postal service it sometimes seems, and is but one of the methods of communication enabled by telecommunications. Several papers explore the communication and community building aspect of the Internet and related tools. Thomeczek examined electronic communication in an undergraduate teacher education course, and compared an e-mail discussion list with a web-based discussion board. Collier and Yoder suggest techniques, based on existing literature, for conducting successful online discussions and collaboration. Tuzun and Yilmaz describe an online learning community of inservice and preservice teachers, communicating via ICQ Active List. Leh and Winograd present some moderating strategies for instructors who are managing online computer conferences. Online communication forums may promote life-long learning, as students continue with these communities after completing their university studies.

Communication is also enhanced by the use of telecommunications to link university classrooms with those in K-12, a practice that has provided unique opportunities for preservice teachers to

observe and interact with schools at a distance. Adcock and Austin discuss their experiences with a preservice observation project that connected the university with public school classrooms via a two-way audio/video conferencing system. Lehman and Razzouk describe a method of observation/interaction using IP-based videoconferencing. Boccia, Fontaine, and Lucas describe a "two-way television teaching, debriefing, and general mentoring" program that led to the development of a CD to help better prepare preservice teachers for observations. Videoconferencing permits students to broaden their perspectives and experiences, as they 'visit' schools, often at a distance.

Online courses also provide experiences 'at a distance,' and studies relating to faculty and students are being conducted to help guide the development of successful educational experiences for all. McKenzie, Waugh, Bennett, and Mims report the findings from their study of what faculty should know about course preparation for online learning. Tucker and Blocher review characteristics of successful distance education students and then describe their study of students and online collaboration. Other papers describe online courses for high school students, and for faculty development.

Integration of technology is one of the 'buzz-words' of the day – teacher preparation programs debate whether to have a stand-alone computer course, or whether to integrate technology throughout the teacher preparation program. What is the best method of introducing preservice teachers to ways to integrate technology into their future classrooms? Redmond and Albion used a newsgroup and a guest 'expert' in communication with preservice teachers to explore that question, and they report the results and explain their choice of methodology. Koro_ec, Kumpulainen, and McManus have also addressed the integration issue – they describe a survey they developed to obtain information about technology integration from faculty and students, on an institution-wide basis.

The papers in this section demonstrate a wide range of uses for telecommunications throughout the educational arena. There are full courses offered via video-conferencing, while others are online over the Internet. There are classroom-based courses, with online or video components. The modes of communication vary, as do the uses to which this technology is put, and the authors provide a view into successful implementations, as well as a discussion of lessons learned and some suggestions for improvement. The body of literature is expanding, as are the technologies. These papers provide a snapshot of ways telecommunications technologies are being used in support of teaching and learning.

Alternative Classroom Observation through Two-way Audio/Video Conferencing Systems

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Abstract: Research has shown the more classroom experience teacher candidates have, the better prepared they will be as teachers. However due to time constraints, liability concerns with on-site visits, and issues of school safety, many teacher preparation programs are seeking alternative observation methods. One such alternative that is being used at the University of Nebraska at Omaha is a two-way audio/video conferencing system. This type of system uses a computer's internet protocol number through the internet for remote viewing of the school site from the university, which enables panning the room to follow teacher-directed large group or small group learning activity. A qualitative study is being conducted to compare the responses of university students who experienced both remote and on-site observations, to determine if there is a significant difference in these two types of observation methods.

Introduction

In the past the only observation experience available to teacher preparation programs was through the student teaching experience. Studies have shown that the more experience in the school classroom, where learning takes place, the better for teacher candidates (Darling-Hammond, 1998). Consequently many teacher preparation programs have teacher candidates in classroom observation visits in every year of the college experience. However considering the time involved, the liability issues of on-site observation visits, and safety management concerns in schools, it is a possibility that visits to community schools from outside institutions such as colleges or universities could be limited or eliminated all together. Therefore, due to the reasons stated above, along with the intrusive nature of observation visits in the school classroom, teacher preparation programs are looking for alternative methods for observation experiences.

Alternative Observation Technology System

At the University of Nebraska at Omaha, federal grant money was secured for a two-way audio/video conferencing system called PictureTel. This two-way conferencing connection is possible through a computer's internet protocol (IP) number that allows for remote viewing of any classroom with ethernet connections to the internet. A port in the firewall, which block incoming and outgoing electronic traffic, must be opened at each site to allow for the two-way connection. A T1 line of a high bandwidth is preferred to handle the high traffic these audio/video presentations generate. One thing to remember is the amount of internet traffic an institution has can make a difference, especially in the video display. This conferencing system allows for two-dimensional viewing of the school classroom through a camera that is very small, only about 8 inches high and 4 inches wide, which is virtually soundless. The microphones are placed strategically around the room to pick up the voices of the teacher and the children. At the university the professor has remote camera controls that permit one to follow the learning activity, whether following

the teacher in large group learning or zooming in on small group learning activities. The video display also allows for viewing of both classrooms simultaneously with the picture-within-a-picture option. The microphones, cameras, and controls can be connected and used at each of the sites, creating a form of distance learning. The remote video observation can be taped, which gives the university classes flexibility for viewing during class, or at a later time for classes which meet in the evening. This taping feature is also helpful with children's classroom schedules which do not provide quality observation time, such as when a child is engaged in quiet reading time, or when children are away from the classroom for lunch and other activities.

The Study

In Human Growth and Learning class, university students have five observation experiences at the preschool, kindergarten, special education, elementary and secondary levels, which are guided by field competencies. By being a part of these observation experiences, university students can gain an understanding of how children learn, in what type of setting children learn, and how children are different in intellectual development and language acquisition due to the physical, cognitive, and psycho-social domains (Flavell, 1993).

In the pilot study university students observed on-site at the preschool, kindergarten and special education classrooms during the first part of the semester. Later in the semester observations were completed using the two-way conferencing system for observing at the elementary and secondary levels from the university classroom. From this pilot experience, several valuable lessons were learned. The two-dimensional remote video observation is more limiting than three-dimensional on-site visits. Therefore it was determined that the best classroom observations using technology are when there is more interaction between teacher and the children, such as in situations involving younger children, or children with special needs. As a result during the next semester, the remote video observations were scheduled earlier in the semester with the preschool, kindergarten, special education, and the on-site visits by university students, in the elementary and secondary classes were scheduled later in the semester. As a result of this change in the observation schedule, university students felt their experiences via technology were more beneficial.

Summary

At the end of the semester a qualitative study using an interview was conducted. Five university students from each of the four classes were randomly selected, of which nineteen students completed the interview. The students were asked to compare the remote and the on-site experiences. In their comparison, the university students were to consider the physical setting of the classroom, the nature of the instruction between the teacher and the children, and the development of an individual child in the physical, cognitive, and psychosocial domains. This study will compare the responses of students having experienced both methods. In consideration of the observation competencies, the faculty will determine if there is a difference in the two forms of observation methods, and if this difference is significant. This study will be used as a guide for future studies of observation methods to determine if these alternative forms are meeting the needs of the university student in their preparation as teacher candidates.

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Looking into Classrooms: A Technology Mediated Observation Program for Preservice Teachers

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Abstract: (75-100 words) This paper reports on a three year federally funded project that demonstrates the feasibility, effectiveness, and replicability of a technology -mediated classroom observation program for preservice teacher education. The study describes technical, staff and programmatic requirements for the project and some of the challenges likely to be faced during implementation. While not a replacement for in-person school visits, the virtual observation offers groups of preservice teachers the opportunity to watch and discuss high quality, real time teaching. The utility and value added of a carefully constructed technology -mediated classroom observation program for teacher education is evident from this study.

Introduction

Intensive, supervised field experiences are widely accepted as critical components of successful teacher education programs. "Prospective teachers learn just as other students do: by studying, practicing, and reflecting; by collaborating with others, by looking closely at students and their work; and by sharing what they see. For prospective teachers, this kind of learning cannot occur in college classrooms divorced from schools..." (National Commission, 1996, 31) In most teacher education programs, preservice teachers are placed in public schools for a variety of observation and assisting activities linked to academic courses in the teacher preparation curriculum. Debriefing of these field experiences usually occurs in the related courses and not onsite with the classroom teachers. Yet, "access [to] expert teachers' knowledge-in-action" is a powerful source of learning about the connections between theory and practice for preservice teachers (Ethell & McMeniman, 2000, p. 99). All too often, the public school schedule, particularly at the secondary level, provides no time for teachers to talk about their work with preservice observers. At institutions that use public schools as field sites, the quality of preservice teacher education is diminished to the extent that opportunity for dialogue about observed practice is missing or limited. Instead of serving as powerful sources for preservice teacher learning, school based observations become little more than time served in schools.

A related limitation of onsite observation is the narrow range of schools accessible to preservice teachers within most regions. For universities located in suburban or rural areas, access to urban educational settings is severely limited. Yet "prospective teachers need experience in schools in which cultural pluralism is valued, and where talk about racial, ethnic, and social –class diversity is a central item in faculty discussions." (Holmes,1990, 36) Increasingly, teacher educators are turning to technology to address the limitations of traditional onsite observation experiences, and in some cases to improve upon them. This paper reports on the *Looking Into Classrooms* project, a three-year, federally funded two-way interactive television classroom observation and dialogue program that linked preservice teachers at a university and public school teachers and students in 8 communities.

Project Overview

Looking Into Classrooms is a technology-mediated observation program for preservice teachers that is designed to expand and enrich their field experiences while simultaneously engaging master teachers in reflection and dialogue about instructional practice. The model uses two-way interactive television technology to provide preservice teachers real time observations and debriefing opportunities with a broad range of high

school classes and teachers. The technology involves simultaneous audio and video communication between university classrooms and high school classrooms, allowing teachers and students in the high school classroom to be seen and heard by preservice teachers and their faculty. The high school students and their teacher can also see and communicate with the preservice teachers as part of a debriefing process. In addition, a web site was established to facilitate master teacher and preservice teacher discussion about the observed classes.

The foundation for the pedagogical model of the project is the Principles of Effective Teaching, developed by the Massachusetts Department of Education. These principles address Currency in the Curriculum, Effective Planning and Assessment of Curriculum and Instruction, Effective Management of Classroom Environment, Effective Instruction, Promotion of High Standards and Expectations for Student Achievement, Promotion of Equity and Appreciation of Diversity, and Fulfillment of Professional Responsibilities. Master teachers for the program were selected in part based on their awareness of and commitment to implement these Principles in their classrooms. Other frameworks of effective teaching could be used for the same purpose, such as the Model Standards for Beginning Teacher Licensing and Development developed by the Interstate New Teacher Assessment and Support Consortium (INTASC Standards).

Project Description

The *Looking Into Classrooms* project and model have the following components:

- A 2-way television connection that provides simultaneous audio and video broadcast and recording capability between the base site (i.e., the college) and the observationsites (classrooms).
- Technology support personnel to develop, implement, troubleshoot, and manage technology-related aspects of the program.
- Camera persons who know where to set up cameras and microphones in accordance with the goals of the teacher and college supervisor
- Email accounts for all participants (preservice teachers, college faculty, program coordinators, classroom teachers, technical personnel) for scheduling and communication.
- An electronic forum with interactive dialogue capacity.
- Master teachers who represent a variety of teaching styles and disciplines in as broad an array of structures and settings as possible.
- A sound framework for defining exemplary pedagogy, such as the Massachusetts Principles of Effective Teaching or INTASC standards.
- Courses of study related to instruction to which the 2-way observation is linked. Course should include, but not be limited to, a methods teaching course where practices are embedded, a pre-practicum or clinical observation program, and an onsite observation program that complements the 2-way observations.
- Permission of participating preservice teachers, master teachers, and classroom students to be videotaped.

As part of the evaluation process, a detailed profile of the *Looking Into Classrooms* model was created based on the "Innovation Configuration and Practice Profile" methodology developed by researchers at the University of Texas at Austin more than 25 years ago. This methodology has been used in countless programs to define the specific requirements for implementing a program faithfully, including Unacceptable, Acceptable, and Ideal levels of fidelity. The Practice Profile for *Looking into Classrooms* can serve as a guide to further implementation of the program or its components not only at the originating site, University of Massachusetts Lowell, but also at other institutions.

Project Outcomes

In the first year of the project, eight secondary-level classroom practitioners, representing a variety of disciplines, were recruited to serve as master teachers. The master teachers were nominated by their principals or by university teacher education faculty based on their excellent teaching and ability to work with newcomers to the profession. The first master teacher group then served as a mentor team to teachers who joined the project in subsequent years. By the project's end, twenty-three teachers were involved as master teachers. These experienced teachers (12-35 years teaching) are well educated and have participated extensively in professional

development related to their subject area, teaching, and/or a specialty area. In addition, their motivation to participate in the program indicates a strong commitment to their own growth (making them excellent role models) as well as to the development of preservice educators.

Over a three-year period, the master teachers conducted a total of 33 two-way television classes and debriefings from eight different communities, including urban and suburban settings, as well as middle, secondary and technical schools. Classes included math, science, English, history, American Studies, special education, bilingual, English as a second language, and a K-16 Life Skills program. In addition, the master teachers participated with preservice teachers and university faculty in an electronic forum for extended discussion of the classes observed and, in the third year, in a student teacher support forum to help novices deal with the myriad issues of the practicum experience. In several instances, the master teachers were selected by preservice teachers to serve as their cooperating teachers in the practicum experience.

Master teachers found the two-way television teaching, debriefing, and general mentoring of preservice teachers a powerful learning experience. For many of these veterans, teaching had become instinctive and they were not easily able to articulate the rationale and purposes for what they did in the classroom. However, in order to respond in the debrief sessions to preservice teacher questions about teaching practice, the veteran teachers began to reflect on and express their professional skills in the pedagogical language used to frame the project. Examples of their reaction to the technology-mediated observation program include the following comments:

"I think the program forces me to look at my own teaching methods - to focus in on discussion and student thinking - not leading."

"I was very interested in interactive teaching. The idea of seeing myself in action as well as talking with teachers about teaching was very appealing."

"This program provides an opportunity for all of us to engage in activities designed to promote better teaching practice."

"I am interested in better education for my students, my colleagues, and myself. This program provides an opportunity for all of us to engage in activities designed to promote better teaching practices."

The 50 preservice teachers who experienced two-way television classroom observations over a three-year period generally agreed that the experience provided a more focused look at teaching than the traditional classroom visit. In addition, sharing the observation and debriefing with classmates enriched the learning experience as preservice teachers compared notes and formed questions about what they had seen in the observation. Finally, the preservice teachers recognized that the quality of teaching provided in the two-way observations was consistently excellent, illustrative of a teaching principle, and varied in methodology, conditions not guaranteed in traditional classroom observations. Another benefit of two-way television observation that preservice teachers listed was the psychological distance afforded by the physical separation of master teacher and observers. This distance empowered preservice teachers to ask hard questions of master teachers, questions that might have seemed too direct or even challenging in a face-to-face encounter. Examples of the preservice teacher comments about the observations and debriefs include:

"2-way observations are very effective. It's very helpful to watch and question real teachers."

"I have enjoyed this portion of the program. This is good quality control because there is too much of a chance students will have bad field observations. The 2-way (observations) are more effective and a better use of time."

"It's especially great to actually see Principles of Effective Teaching in action, which wasn't always happening with onsite observations."

"I thought the teachers used in the 2-way were superlative. It was a very good variety of styles and levels."

"Discussion (live) with peers and master teachers was by far the most valuable aspect of the semester."

"The debriefs were great. Don't change them. Talking to the teachers about their methods was extremely effective."

Although not part of the original project plan, a CD-ROM was created using clips of the first year's two-way classes as a tool to train preservice teachers in classroom observation skills. This component of the project was well received by all participants and led to a supplemental funding application to create a CD using higher quality video and focused questions for observation training in the future.

Preservice teachers also found the observation booklet to be "very useful in organizing thought and a great tool to explain what you should be looking for." The electronic forum was less well received in part because, in its original design, it was cumbersome to access and demanding to use. Subsequent versions of the forum alleviated the initial design problems but preservice teachers continued to resist discussing their

observations after the experience. Only when master teachers joined the forum, and preservice teachers were required to make weekly postings to the forum, did the participation rates and quality increase. Indeed, from beginning to end of the third project year, the length, depth and quality of preservice teacher comments, reflections and questions to master teachers increased substantially. The public and professional nature of the electronic forum, as well as preservice teachers' experience with the tool and their own emerging identities as teachers, may explain the marked improvement in the dialogue over time.

Conclusions

The Looking Into Classrooms model has demonstrated substantial viability as a complement to more traditional methods for providing preservice teachers with opportunities to observe master teachers at work. The main reason for developing a technology-mediated classroom observation model was to expand the range and quality of classrooms and teaching styles preservice teachers could observe, and to provide the opportunity for dialogue about teaching with master teachers; the project achieved these goals. It also achieved a number of other outcomes that were not anticipated in the original study design, but emerged in the course of project implementation.

Some of the unanticipated outcomes had positive impact on the project. For example, the need for preservice teacher observation training that included demonstrations of what to look at in classrooms became apparent in the first year and led to development of the Beta version of the CD-ROM and eventually to a purpose-shot CD linked to the national INTASC standards. The dramatic improvement in preservice teacher questioning and reflection skill as a result of the debrief experiences and electronic forum assignments suggests the power of group learning and public discourse on practice, learning principles worth extending into other educational arenas. The unexpected assumption by master teachers of an active, sustained mentoring role led to them being viewed by preservice teachers as the experts, not only in the classroom but also in the electronic forum. The uncustomary collaboration of university faculty in planning and viewing classes via two-way television meant that preservice teachers from a variety of disciplines and grade levels came together to watch and debrief classes in fields and levels outside their own. These "out-of-field" observations were reported by preservice teachers to be among the most powerful experiences in their preparation experience. At the school level, too, there were unlooked-for outcomes. The high school students being observed via two-way television found the experience exciting and important. Their teachers reported that the students always wanted to know "how they did" and what the preservice teachers thought of the class. If there were more time in both the high school and university schedule, conversations between the students and preservice teachers could prove very informative for both groups.

Not all outcomes, however, were positive. We were surprised to find how many university faculty were reluctant to give up scheduled class meetings to have their students participate in two-way observations. The logistics of planning two-way television observations in high schools, with their different and often changing schedules, was a constant challenge for the technical staff as well as project directors. Even when the schedules worked, the technology infrastructure in some communities and at the university was not always reliable. A promised cable connection to one high school did not materialize, the sale of another cable company resulted in an end of linkage between another community and the university, a snowstorm damaged the university microwave. Fortunately, rapidly evolving technologies made it possible to connect schools and university via ISDN lines using compressed video. While not originally considered a quality connection, the new versions of this equipment provide high quality audio and video signals without dependence on public access cable channels and all the complex politics that accompany use of these services.

We have learned a host of lessons about school-college collaborative projects, about distance learning technologies, and teacher education in the course of directing what became a four-year program linking eight school districts to a university. Our advice to people who might replicate this project, or undertake a similar one, is to use the simplest and least expensive technology available, a feasible approach given advances in the Internet and bandwidth size; to involve school people in the planning and guidance of the project from the outset, especially onsite technicians who understand the infrastructure of the different buildings in their school districts; to expect higher education faculty resistance to any instructional methodology different from their prevailing practice, and to create powerful motivators to get faculty onboard; to be flexible in project implementation so as to accommodate unforeseen challenges and opportunities; and to talk to other people doing similar projects at other institutions for ideas about solving problems common or endemic to the work. Finally, we would caution project replicators about the complexity of creating high quality CD-ROMS. Both

pre and post production efforts are far more complicated than we had envisioned based on our Beta CD and may be better done by a professional organization than an in-house. staff. These cautions notwithstanding, we would also strongly encourage others to undertake school-university collaborative projects to support preservice and inservice teacher development using technology. The common cause of preparing the next generation of teachers and the challenge of using technology to do so created a powerful, sustained partnership between schools and universities that continues beyond the funding period and has become an integral part of teacher education at the originating university.

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Tour, Think, and Tell: A Video Conference Virtual Field Trip

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Objectives:

Conferees attending this session about a video conference will discover how:

1. Urban schools with limited funding and resources can present otherwise unattainable learning experiences for underprivileged students.
2. To maximize school/university and PT3 partnering and learning through video conferencing.
3. To involve elementary students, preservice and inservice teachers, PT3 teacher educators, and technical assistants to collaboratively provide authentic, virtual classroom learning.
4. To collaboratively work together across educative roles to technologically prepare and implement meaningful learning opportunities for learners at multiple levels.

Presentation Outline and Format:

Beginning this presentation, the technology coordinator and a PT3 inservice participant at the urban elementary school will detail how a video conferencing project moved from idea to actuality. Each representative involved in the grant activity, the technology support director, and the school/university partnership liaison, will describe their role in making the video conference a reality for the third grade students and preservice teachers on site at the urban school and at the secondary university site. Digital photos and video clips inserted into the PowerPoint™ presentation highlight aspects of the descriptive portion of the project and image the realms involved in this collaborative technological effort. The project offered urban students an opportunity that most have not had, that is to virtually travel to the Tennessee Aquarium as a culminating activity to classroom study. Additionally, it provided elementary preservice teachers with a first hand, technological experience that made virtual resources available to field settings with limited resources. Educators at varied levels collaborated in partnership and modeled effective education. The third grade students accomplished literacy standards outlined by the ISTE, especially standards 6 & 7 for grades 3 –5. The performance indicators for teachers were met in this project. The ISTE professional performance profile was met by preservice teacher involvement. The format for this presentation is a panel, with interactive discussion. Questions and answers will be encouraged.

Research Implications

Because the teaching force will change dramatically over the next decade, and the fact that the nation's schools will need to hire 2.5 million teachers over the next 10 years (Hussar, 1999), provides an unequaled opportunity to transform the quality of teachers serving our nation's schools. Researchers' work led to clear conclusions. Teachers exert a powerful influence on the academic performance of students, and some teachers are consistently more effective than others. The success of teacher education programs ultimately will be judged by how well the K-12 students of our graduates perform. Furthermore, we recognize that to prepare students for success in careers and life within a technologically advanced society, teachers and higher education faculty must be able to model and reinforce effective use of available technology through teacher preparation: disciplinary knowledge, pedagogical practice, and clinical experience.

Technology implementation during teacher preparation is a predictor of whether preservice teachers use technology as inservice teachers. Unfortunately, most do not use it during field experiences, nor do they apprentice with teachers who do (ISTE, 1999). It is our commitment to establish sound pedagogical practice in effective learning environments to better educate youth, while providing model technological conditions for involved educators at every level (Wiseman, Cooner, & Knight, 1999). Tracing Virtual Travel: Touring, Thinking, and Telling about Video Conferencing, our presentation, is a component of a PT3 grant funded by the U.S. Department of Education. By this activity, we prepare teacher/leaders through infusing technology into curriculum with the collaborative mentorship of inservice and teacher education faculty in clinical and university settings. This presentation features quality, educative, technology methods from a PT3 mentorship initiative. Conferees will see, hear, and discuss a project in which third grade students in an urban school/university partnership learn about animals/insects at the aquarium through a video conference session which was also viewed on the university campus by preservice teachers not yet placed in field settings.

The presenters' qualifications range from technology coordinator/teacher in the elementary school, associate and assistant professors in teacher education, and a technical support director within the school of education.

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Video Conferencing as a Tool to Link Colleges of Education with K-12 Schools: A P3T3 Project Initiative

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Abstract: Distance education technologies offer capabilities that can be used to enhance teacher preparation while addressing technology integration issues in teacher preparation programs. Video conferencing allows pre-service teachers to observe and interact with K-12 classrooms at a distance. This can provide needed access to diverse student populations and examples of exemplary technology use that may not be available in nearby schools. As one part of P3T3: Purdue Program for Preparing Tomorrow's Teachers to use Technology, two-way video conferencing is being used to link college students and classrooms with K-12 students and classrooms. Particularly promising are new IP-based videoconferencing systems, which support high quality video conferencing over the Internet. Initial experiments in the use of this technology suggest that it provides a viable alternative for some types of student observations and interactions with K-12 teachers and students that typically occur through traditional field placements. Advantages include support for directed observations, linkages with diverse settings, and integration of technology. Limitations include issues with school firewalls, classroom audio, and the fact that these are not true field experiences.

Introduction

Distance education technologies can be used to enhance teacher preparation while addressing technology integration issues. Future teachers can use distance education technologies to observe and interact with K-12 classrooms from afar. Experiments involving the use of closed-circuit video technologies to link colleges of education with K-12 classrooms date back many years (e.g., Abel, 1960). In the 1980s, Iowa State University's Teachers on Television project used microwave-based video connections to link the campus with multiple public school classrooms and teachers. Project results showed that the observation skills of pre-service elementary teachers could be improved through training involving the use of these video connections to classrooms (Hoy & Merkley, 1989). However, these older video technologies were expensive and difficult to set up and maintain. Today's video conferencing technologies offer a flexible and cost-effective option.

P3T3 Project Video Conferencing

Many colleges of education face difficulties placing students in field situations that provide for needed experiences such as access to diverse student populations and examples of exemplary technology use. This problem is particularly acute for Purdue University, which is not located near a major metropolitan center. As one part of its P3T3: Purdue Program for Preparing Tomorrow's Teachers to use Technology project, two-way video conferencing is being used to link Purdue students and classrooms with K-12 students and classrooms. Particularly promising are new IP-based videoconferencing systems, which support high quality video conferencing over the Internet. These newer technologies are more flexible and less expensive than preceding video technologies.

We use equipment from Polycom (http://www.polycom.com), which makes room-to-room as well as computer-based desktop video conferencing units. Viewstation SP or Viewstation FX units are used for room-to-room conferecning. The Viewstation SP connects two sites at data rates up to 768 Kbps. The Polycom Viewstation FX is a high-end room-to-room unit that has a built in a Multiple Control Unit (MCU), a device that bridges together multiple inputs so that up to four sites can participate in a video conference. Computer-based desktop video conferencing is done with Polycom's ViaVideo, which offers video and audio of high quality at connection speeds of up to 384 Kbps. ViaVideo, which is available for Windows-based PCs, supports file sharing, whiteboard, chat, and file transfer along with video conferencing.

A year-and-a-half experience with IP-based video conferencing technology suggests that it provides a viable alternative to traditional field placements for some types of student observations and for interactions with K-12 teachers and student. The technology offers several advantages. (1) Beginning pre-service teachers are poor classroom observers. Using video conferencing, pre-service teachers can make observations under the direction of a faculty member and so improve their observational skills. (2) Students cannot observe a full range of school settings in close proximity to the college campus. This technology supports linkages with schools at remote sites that can provide access to diversity, technology use, etc. (3) The technology is relatively inexpensive, easy to use, and flexible. Because it requires only a fast Internet connection, it can reach places that other technologies cannot easily reach.

However, as with any new technology, there are also shortcomings. (1) IP-based video conferencing equipment requires access through the school's Internet firewall. School technicians must make the necessary arrangements, which can be time-consuming and difficult if the school's technical support staff is not fully knowledgeable about firewalls. (2) Video conferencing over the Internet requires high bandwidth (typically 128 Kbps or better) to insure a stable connection of acceptable quality. Network traffic can lead to degradation or even interruption of the connection. (3) This is a new way of communicating for most people. Participants have to take time in the beginning to get used to the technology and become comfortable in using it. (4) Audio problems can limit observations and interactions. Typical classroom noise makes it difficult for pre-service teachers to listen to particular conversations in a busy classroom. This is not usually a technical problem per se, but it can cause problems. For more information, visit our website at: http://p3t3.soe.purdue.edu.

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In Their Own Words: Pre-service Teachers' Perceptions of ICT Integration

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Abstract: Pre-service teachers participated in an online discussion that included a guest who facilitated conversation about integration of ICTs. Students mostly agreed that integration of ICTs was desirable but differed in their views about specific practices. They demonstrated awareness of the challenges facing teachers and schools in integrating ICTs but appeared to have had little personal experience of ICT integration during field experience.

Prologue

One of us is old enough to have taught in the 1970s, when the other was a child in primary school and the place of information and communication technologies (ICTs) in education was very different from today. The terminology of ICTs had not been invented; hand-held four-function calculators were new technology; and a few pioneers were beginning to use computers in schools. Where computers figured in the curriculum, they were objects of study in "computer awareness" or "computer literacy". Most often these topics were the province of teachers of mathematics or science and they frequently involved consideration of binary notation, boolean algebra, half- and full-adder circuits and programming in BASIC. In the late 1980s, there was an expansion of ICTs from mathematics into business education with a focus on teaching skills for generic software such as word processors and spreadsheets in an office environment. The focus throughout those decades was on teaching *about* computers.

Now, over 25 years later, personal computers have been available long enough that one of us has an adult daughter who cannot remember home without computers. Personal computers are common and easy enough to use that his grandchildren regard email as a basic form of communication with extended family and one grandson had digested his knowledge of dinosaurs, gained largely from independent use of CD-ROMs, into a personal web site before beginning school. The other of us has owned a computer since the beginning of her teaching career and her son, considers the use of an eyeball camera and computer as a normal method of communicating with his godfather who lives 1500 kilometers away. Our grandchildren and children consider technology as part of their every day life. For them, ICTs are thoroughly integrated. Our task is to prepare teachers to integrated ICTs in their teaching.

Context

Recent Australian reports have referred to the "information economy", the "knowledge society" (DETYA, 2000) or "knowledge nation" (Jones, 2001). Regardless of terminology, it is clear that the impact of ICTs requires changed approaches to education. It is no longer sufficient, or even, perhaps, necessary to teach *about* computers as in the 1970s. It is necessary to teach *with* and *through* ICTs to prepare students for life in a rapidly changing world.

Queensland policy on computers in education began in 1983 (Galligan, Buchanan, & Muller, 1999). Its focus was on computer awareness, basic skills, computer assisted learning and vocational programs. In 1991 the effect of rapid technological change on learning and teaching was identified as one of eleven key issues for Queensland education and the integration of information technology for learning and teaching was listed as one of four goals for schooling (Queensland Department of Education, 1991). In 1994 a revised policy document, emphasized the use of computers to support learning across the curriculum at all year levels, while still acknowledging the importance of computer skills for future employment (Queensland Department of Education, 1994). *Schooling 2001* (Education Queensland, 1998b) set system-wide targets to be achieved by 2001. These included the provision of one computer for every 7.5 students, the connection of every classroom to the Internet, and the use of computers "in all key learning areas, P-

12". Minimum standards for teachers in the use of learning technology were set (Education Queensland, 1998a). More recently the *New Basics* project has shifted the focus to the application of ICTs within *rich tasks*, which span multiple curriculum areas. Examples include the construction of multimedia profiles and web pages by children in their third year of schooling (Education Queensland, 2000).

Australian education has two goals for ICTs in education (Toomey, 2001). They are that students leave school as "confident, creative and productive users of new technologies" and that schools integrate ICTs to "improve teaching and learning". These same themes have emerged through the development of Queensland policy. As ICTs become more deeply embedded in society, the focus on teaching ICT skills as distinct from the use of ICTs for teaching and learning blurs and the two goals merge. Although teacher education programs will need to adapt to these changes, there is, as yet, no mandatory requirement for teacher preparation programs in Queensland to ensure that graduates meet the minimum standards in learning technology nor even to address the issues of technology integration. However, most programs have responded. A previous paper described some approaches being adopted at the University of Southern Queensland (Albion, 2000) including modeling of ICT integration within classes and the design of a course (85045) focused on preparing graduates to meet the minimum standards and to integrate ICTs. This study was situated within that course which is described in more detail elsewhere (Redmond, 2002).

Method

Both authors and a colleague taught in the 85045 course in first semester of 2001. In the belief that computer mediated communication (CMC) was an important tool for teachers and that there was value in learning through practical experience, students were required to complete minor group projects using CMC in the form of mailing lists and newsgroups. The activities provided a context for CMC experience but, given that the tasks could have been completed in face to face meetings, were somewhat contrived. In reviewing the course, a less contrived CMC activity was sought. Previous studies have demonstrated the value of an "online guest" in providing a "focus for dialogue" and directing conversation (Williams & Bowes, 2000). It was thought that an online guest would provide purposeful focus for the CMC activities in the 85045 course and be less contrived than the original activity.

In second semester of 2001 one of us (Albion) was working in the USA. This provided an opportunity to engage students from the 85045 course in a CMC activity involving a member of the course team as an online guest. The proposed activity would allow the absent team member to maintain contact with the course and enable students to experience, by modeling, a teaching approach which might be applied in their own future classes. Experience with students in previous offers of the 85045 course had suggested that many found difficulty in grasping important concepts associated with integration of ICTs into teaching and learning. Hence integration of ICTs into teaching and learning was selected as the topic of discussion with the online guest. As it happened the "guest" was concurrently teaching two sections of a course discussing technology integration with teacher education students in the USA.

To allow time for introductory work, the activity was scheduled for a block of six weeks in the middle of the course which, allowing for a two week recess, corresponded to four weeks of scheduled classes. The activity was announced early in the semester when the classes were introduced to the use of CMC. Because students in this group had some prior experience of electronic mail including listservs and personal mailing lists, a newsgroup was selected as the CMC venue for this activity in order to provide students with experience of threaded discussion. The newsgroup was created two weeks prior to the date set for introduction of the guest who was to join the group on Monday, September 7. The first author posted a message introducing the guest four days prior to the scheduled start of the activity. By that time one student had already posted an anticipatory message and three others did so before the guest made his first posting.

Results

Figure 1 shows the distribution of postings over time. The recess is visible as a period of reduced activity. Most postings occurred on days when classes met in computer laboratories and tutors were able to prompt activity.

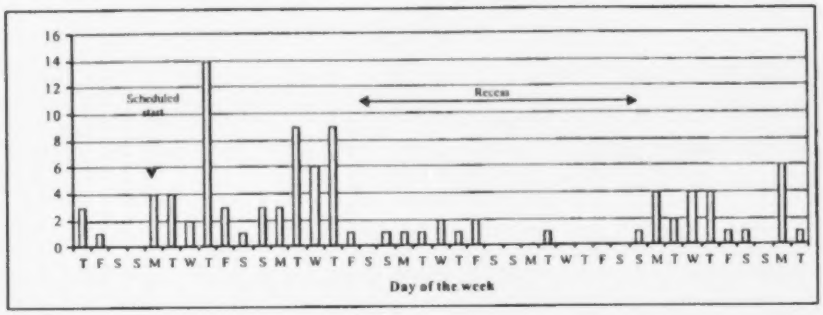

Figure 1: Distribution of postings over time

Table 1 provides the distribution of frequency of posting by individual students. Most students posted just once and relatively few posted more than twice. Several of those who posted twice appeared to have done so in error, possibly because the repeated the process when their first attempt was not immediately visible in the list of messages. Assessment credit was available for posting, so many of those who posted once did so for that reason although their posts were typically no less relevant than those of the more frequent correspondents.

Number of postings	0	1	2	3	4	5
Frequency (N = 80)	24	41	10	3	1	1

Table 1: Distribution of postings among students

In his introductory posting the guest commented on the value of having a sense of direction in daily life and invited students to comment on the need for teachers in a school to have a common understanding or sense of direction in regard to ICT integration. Students were also invited to explain why they thought a common view was or was not necessary. The first responses tended to agree that some common view was necessary although it was not long before ambivalent and contrary opinions surfaced. The earliest responses suggested that the common view:

"should be couched in plain language, simple, ... that can accommodate people from disparate backgrounds"
"serves as a direction for how the school functions with technology, (having different understandings) may result in conflict among teachers".

Most students agreed with the proposition that a common view was desirable. Their reasons for thinking so varied:

"(communication among teachers is possible) only ... if all parties are coming from the 'common view'"
"(a mutual decision is needed) about the importance of children learning, understanding and interacting with technology in the classroom."
"If teachers don't know what they are talking about, or have a different understanding of what technology integration is, then the students we are teaching will be even more confused than they already are."
"so that students don't miss out regardless of a teachers perception of information technology"
"in order to benefit children's learning and also to share a common school goal and understanding"

Some thought that an effort to develop a coherent shared view of technology integration might be doomed to failure:

"How can you possibly get a bunch of diverse adults with different ideas on what technology should be used, then get them to agree on what technology integration means? I foresee a turbulent time. ☺"
"Since there are so many divergent views on what education is, and how it should be approached, I doubt that teachers will ever agree on what technology integration is and how it should be approached"
'I think it would be very difficult for all teachers to agree on technology integration within classrooms. For one, the broad range of abilities of teachers gives a large range in classrooms with regards to the amount of technology being integrated."

There were others who expressed ambivalence or, perhaps, an appreciation of the complexity of the issue:

"... do they need to have a common view? Well... yes and no. Yes they do need to have a basic understanding or platform, but every teacher will interpret technology integration as appropriate for their curriculum area

and age group. It will be different and so it should be. Teachers are individuals with varying abilities, experiences and personalities. Their approach to technology integration will reflect this. If teachers integrated technology in the same way for all subjects, what a boring place!"

"Common views improve communication and make the use of time more efficient. They can however exclude new ideas or perceptions which could make education an easier more productive experience"

"The common understanding is important as this will provide continuity throughout the grades and between classes. However some diverse views may stimulate some discussion, critical reflection and evaluation that makes the curriculum integration plan better. Thus I think it is important to have a common understanding but one that is open to discussion and change"

Although few threads developed beyond two levels – message and response – it was evident from the references to other postings, mostly agreement, that students were actively reading the postings. At the end of the first week it was one of the mature age students who anticipated the guest's intention by writing

"Most agree that Yes most teachers should have a common understanding of Technology Integration. But most also agree that the task may be quite impossible with the current abilities of teachers ... (for this discussion) we should at least have a common understanding of the meaning ... I would like everyone to give their definition.'

Acknowledging this response, at the beginning of the second week the guest briefly summarized the postings to that point, expressed an interest in having students define "technology integration" and drew some parallels between ICTs and literacy education. He then invited responses to two new questions. The first was to provide a definition and the second to make a comparison between the position of ICTs in education and that of basic literacy or reading and writing. Some students appeared to agree that there were parallels and developed the idea further:

" 'integrating technology' into the classroom is about being able to use technology as a tool in the classroom to enhance learning, just like any other tools such as books ... Books opened up the world to people from the time of the first printing press ... just as technology of another sort, computers, can open up the world for people. As always though, equity is a problem"

"If you regard IT as a Literacy, just as English is, then it obviously needs to be deeply integrated into school activities, as well as being explicitly taught. But don't mathematicians and scientists (for example) also believe that mathematical and scientific thinking should permeate all areas? Don't you think it could get a bit top heavy if all learning areas are regarded as a dominant discourse?"

"When I think about the concept, I see it as a teaching tool - a way of teaching the skills and knowledges within the (curriculum). It seems to be closer to ... principles of teaching and learning, than a specific subject area ... The problem is that IT as a 'subject area' within schools is not the same as 'IT integration' across the curriculum - a bit like the difference between teaching literacy as a specific subject, and using literacy techniques within teaching of other subjects ... while individual teachers may hold a common understanding of exactly what that is, the way they use it within the classroom is going to be different"

As early as the second day of discussion there had been comments about resources and teacher preparation for ICT integration. One student had commented that some teachers are "*dead scared of computers*" and "*ignorant of the ways they can be used*". He called for additional funding for resources and trained support personnel in schools and others offered similar comments. Continuing this line of practical comments, students wrote:

"... there are millions in this country (who are not computer literate) and many hundreds of millions who are struggling to become literate in any sense ... ICTs would have to be all pervasive for the need of another 'literacy', that is when all of us have access to these technologies all of the time ... in a typical high school classroom there isn't any access to these technologies!!!!!"

As might be expected in a conversation of more than 50 voices, albeit each only briefly, many ideas were expressed in no particular sequence. Some students waited until the end of the activity to express their thoughts, which were as likely to be linked to the first postings as the later ones. Despite that there did appear to be some development in ideas as the conversation progressed although there were dissenting opinions even in the closing stages:

"I think there is too much emphasis on technology. Children cannot spell any more ... Even though I don't mind computers, children should not be exposed to them at such a young age. ... Why can't we teach younger to type on typewriters and then at a later stage - high school- put them on computers. I also had given an assignment ... one of the tasks was to write the assignment out by hand. A lot of children were complaining. What does this say about our emphasis on technology?"

"I too think there is to much emphasis on technology especially in primary schools. Within a high school computers become more important in the publication of assignments and important for future employment or university studies."

During the second week of discussion, the guest had recounted an example of a teacher integrating ICTs and invited students to contribute their own examples. Few chose to do so, which was, perhaps, a reflection of the paucity of examples they had seen during field experiences. There were some comments in response to the invitation:

"I am quite concerned to say that I cannot think of a specific example!! This worries me a little. All I can say is that we are the new fresh faces going out to teach and we need to integrate technology into our lessons and provide variety."

"I think it is quite unfortunate that we have so few positive experiences to contribute to the group of how to integrate technology into the classroom. ... I saw some examples where IT was used satisfactorily, such as researching assignments and preparing either the essay or the presentation, and some examples where the teacher stopped teaching and just expected the IT to do the job for her without effective monitoring."

"From what I have seen out there the students know more than a lot of the teachers and have better facilities at home."

Conclusions

Possibly without exception these pre-service teachers saw ICTs and their integration as important issues in their future careers as teachers. However, some seemed to experience some difficulty in articulating a view of what ICT integration might mean in practice and others appeared skeptical about what they saw as an emphasis on ICTs rather than the more traditional values of education. Both of these findings are perhaps related to the relative paucity of good examples of integration encountered during field experience. It is inevitably difficult for them to imagine how they might engage in behaviors for which they have few models. There is a clear need to continue developing university programs which model ICT integration and to develop stronger partnerships with schools where appropriate models are in practice.

There seemed to be a substantial level of awareness of the challenges faced by schools and teachers seeking to integrate ICTs. Among those referred to in the discussion were curriculum pressure, lack of ICT resources, inadequate technical support and a continuing need for teachers to receive appropriate professional development. As a group they appear to harbor few illusions about the challenges they will face after graduation.

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Helping Students Pass PRAXIS I

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North Carolina Agricultural and Technical State University and Winston-Salem State University were awarded ar eLearning grant from the state of North Carolina to develop computer based resources for helping students prepare for PRAXIS Exams. The resource for the Elementary Education PRAXIS II was developed by a team of content experts and an instructional designer. The PRAXIS I was developed by the instructional designer.

First the general areas of the test were examined and the initial design broken down into the three major sections found on the test. These three major sections became the main menu which also informed students how long each portion of the test is and the type of items on the test. From the main menu students are linked to Reading, Writing, and Mathematics sections. These sections are further divided into submenus.

One submenu contains the basic areas that are addressed in Reading. This section is divided into a section that provides vocabulary-building tips, different ways to determine the meaning of unfamiliar words, and steps that can be used to help interpret passages and answer questions about those passages. In addition to the information contained in each of these sections, there are links to websites that address vocabulary development.

Another submenu deals with writing. There are three major areas represented on this menu: sentence correction; writing essays; and links to web sites that can be used to help improve writing skills. The sentence correction menu provides information about parts of speech, mechanics, homonyms, and sentence structure. The section on writing essays gives a basic procedure for writing an essay. The links to web sites include sites that explore and teach about a variety of writing related information such as, grammar and graphic organizers.

The last section of the resource deals with the areas of mathematics that are addressed on the PRAXIS I. The areas covered through information and links are whole numbers, exponents and square roots, order of operations, decimals, fractions, number theory, ratio and proportion, percents, probability, statistics, logic, permutations, scientific notation, equations, geometry, coordinate grids, formulas, graphs, and problem solving.

This study resource is not meant to initially teach or tutor students. The function is to provide an organized resource that students can access and use to review areas where they are experiencing difficulty. Students at North Carolina A & T State University are given practice tests and the areas of the test where they show weakness are identified. It is hoped that the study resource will help students review their weak areas and be better prepared to take the exam.

Improving Experiment Project Evaluation through Web-based Self- and Peer Assessment

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Abstract: This study attempts to incorporate the Web technology into the self- and peer assessment procedure, and then to make it a part of the instruction activity. The results of this study indicate that the Web-based self- and peer assessing activities could be successfully incorporated into classroom instruction of experimental psychology. Moreover, the discussion among peers over their opinions and feelings about the observation and assessment results helps consensus-building among participants in evaluation and improves the objectiveness of their assessment.

Introduction

The study on learning in the last decade can be generally described as being dominated by the situative/interactive perspective (McCaslin & Hickey, 2001; Greeno, Collins & Resnick, 1996). The situative/interactive view of learning has not only created major impact on curriculum design and teaching methods in recent years (Palinscar, 1998), it has also greatly promoted the reform of learning assessment (Cizek, 1997; Gipps, 1999; Shepard, 2000). To sum up the opinions of the scholars advocating this new culture of learning, they share some common views on the new learning assessment: 1. Students should actively participate in the process of assessment. 2. The assessment should reflect the process and results of learning at the same time. 3. Assessment should be effectively combined with instruction. 4. The subject of evaluation should be extended from the cognitive aspect to cover the student's social interaction and practical participation in the community. 5. Increased attention to evaluation for high level thinking and complex operations.

In recent years, some classroom evaluation methods that conform to the new expectations for instructional assessment began to emerge. For example, self- and peer assessments are enjoying growing prestige. From the perspective of learning, these two evaluation methods are not only special in letting students actively participate in the evaluation. They also allow the students to reflect on the amount of their effort invested in the process by observing their own products, and to decide whether the standards they set are appropriate. This can be very beneficial for the students' self-monitoring and adjustment. Furthermore, self- and peer assessment can be combined with performance assessment and portfolio assessment. The combination may generate even better evaluation effects (Paris & Paris, 2001). Because they have those evaluative characteristics that conform to the new learning culture, quite a number of scholars have advocated the adoption of these methods as one of the effective methods of class evaluation (Boud, 1995; Falchikov & Goldfinch, 2000; Shepard, 2000).

The first objective of this study is to explore whether there is a decrease of over-marking or under-marking in self assessment results under the situation where self assessment and peer assessment are integrated. The second objective of this study is to explore the observation among group members on the scoring results and the discussion process. Is it possible to make the scoring behavior of team members more consistent, thus improving the inter-rater reliability? And is it possible to make the evaluation standards more consistent with those of the experts, thus decreasing the over-marking and under-marking in self- and peer assessment and improving the correctness of the results? As evaluation activities, self- and peer assessments are also fit to be embedded in the instruction activities as part of the instruction. The third objective of this study is to attempt to design self- and peer assessment activities based on the World Wide Web environment that are more suited for application in the instruction situation as the extension of class instruction activities. Meanwhile, we try to observe through computer records the changes in the evaluation behavior of self- and peer assessment under peer interaction.

Method

Participants: the participants in this study are 34 sophomore students in the Experimental Psychology class.

Tools/materials:

Web-based Self- and Peer Assessment System: the tool used in this study is Web-based Self- and Peer Assessment System (Web-SPA), developed by the researchers. The system contains several modules: setting evaluation standards, observation of products, observation of evaluation results, discussion, self assessing, and peer assessing and is capable of synchronous and asynchronous assessment on the Web.

Evaluation scales for the experiment projects: Eight Likert five-point scales for evaluating the quality of experiment plans. The contents of the eight scales are the evaluation of the following aspects of the plan: theoretical basis, criticalness, innovativeness, logical coherence of thinking, and appropriate hypothesis verification method.

Experiment project: the five teams chose their own topic for the five projects before writing them down. The projects must contain the following elements: motives and objectives, literature review, research hypothesis and research method.

Procedure: In the first week of experiment evaluation, the groups uploaded their products to an assigned Website and made self-assessment according to the eight scales in class. After that, the participants may go online to conduct observation and peer

assessment at the time of their choosing. Self-assessment can also be revised as the peer assessment proceeds. The participants may leave messages in the guest book on the Website. In the 110-minute class lecturing session in the second week, the following activities were performed in five stages: (1) reenacting the observation, peer assessment and self assessment activities. (2) the system compiled the results of the scores given to the groups by their own members, and showed them to the group members along with rankings and comments. Discussions were conducted within the groups, and re-scoring was allowed after the discussion. (3) The system compiled the scores and ranking of the groups by other groups, and the total ranking was made according to the scoring of the whole class. The participants were asked to conduct discussion on the merits and flaws of the works by their own group and those by other groups, the basis on which they scored (ranked) the groups as well as their degree of satisfaction with how other groups scored (ranked) the works by their group and other groups. (4) Each group then sends a representative to present oral report and defense of 5 to 8 minutes about the conclusions reached in the discussion in stage (3). (5) The teacher made comments for about ten minutes.

Results

This study collects the results of the self assessment before observing the projects of others, the first self- and peer assessment after the observation and before peer interaction, and the results of the last self- and peer assessment after peer interaction (reading the scoring results within and among groups and discussing the results). The average scores of each group (Table 1) are calculated by summing the scores in the eight five-point scales of group members (the scales 3, 6, and 8 are reverse marking), and then divided by scale number and the number of members in each group. Numbers closer to 1 means low score, and numbers closer to 5 means high score.

This study calculates the Kendall's coefficient of concordance (W) of the last assessment results by group members before the observation/discussion and the last assessment results after the observation/discussion (Table 2). The outcome shows that the Kendall's coefficient of concordance increases in all five groups when the materials for assessment include their own products. In groups 4 and 5, the results change from lack of significant consistency to significantly consistent (W changed from .342 and .101 to .491 and .355, respectively). When the rating data from one's own group are deleted from the assessment material, calculation is only done on the data of peer assessment. The results show that except for group 1, whose coefficient of concordance lowers slightly, all four other groups show the trend of increase. Groups 3 and 4 changed from lack of significant consistency to significantly consistent (W changed from .336 and .303 to .428 and .445, respectively). The results above indicate that through the sharing and discussion of assessment results with each other, the participants indeed managed to build better consensus about the substance of the products and gain better understanding of each other's viewpoint. As a consequence, the consistency of scoring behavior is improved.

It is certain that the process of sharing and discussion helps improve the consensus-building among group members, but would this kind of consensus lead to even more inflated (over-marked) or self-deprecating (under-marked) scoring, thus deviates from the expert scoring even more? Or would it make the results clearer and more correct, bringing them closer to the expert results? To clarify this problem, this study makes a comparison of the expert rating with the assessment data before the discussion and after the discussion. The Spearman's ? were calculated (Table 3). The result shows that except for groups 1 and 3, the Spearman's ? of the expert data and the data of all three other groups shows inclination of increase. Groups 2 and 4 changed from the opposite direction of the experts (? is -.20 and -.70 respectively) to the direction consistent with the experts (? is .80 and .30 respectively). The reason why the Spearman's ? for group 1 changed from positive value to negative is that the group started with a view quite consistent with the experts' before the discussion, but dramatically elevated the ranking of their group product to number one after the discussion. The excessive deviation from the expert assessment data changed the Spearman's ? from positive to negative value. We can see from the information above that the sharing of opinions about assessment and products through peer interaction not only helps to build the consensus among group members regarding the rating of products, it also helps to improve the correctness of their assessment to a certain degree, thus improving the criteria-relevant validity.

From the process of group discussion and concluding report, one can observe a participant's view of his own product, his criticism of the products of others, his response to other people's criticism in defending the substance and value of his product, and his decision-making process of whether to revise his ratings after reading the rating results of his own and other people's works. The discourse data help to give a clearer insight of the influence of peer interaction on self assessment and peer assessment.

This study finds that in the process of self- and peer assessment, the students can indeed have more direct application and discussion about the evaluations standards for experiment projects they have learned. They have more reflection and reexamination of their own products and other people's products. They have more direct feelings and response for the comments of others. This study also shows that using the World Wide Web to be a potential device for classroom instruction, the data of self- and peer assessment—such as the materials for evaluation (experiment projects) and the results of assessment—can be recorded and shared through the mechanisms of Web-based systems. Therefore, they can be conveniently used in real classroom instruction situations, making the combination of evaluation activities and instruction more feasible.

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A Comparison of Two Types of Electronic Communication in an Undergraduate Teacher Education Course.

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Abstract: In education, teachers face the dilemma of increasing job requirements and decreasing time available to students. This leaves faculty with a dilemma of how to be available to their students for questions and concerns as well as how to provide feedback to their students in a timely manner. This research study looks at the use of two different electronic discussion forums in an undergraduate teacher education course. The amount of student use and student attitude toward the two different types of communication are examined.

Purpose

The goal of this research study was to better understand the role computer-mediated communication (CMC) plays in the classroom. Two common types of CMC were selected for comparison. The first is communication through an organized email discussion group (often called a listserv), and the second is online discussion utilizing a web-based discussion group. This study examined if differences exist between email-based and web-based discussion groups as determined by: (1) total number of messages posted and (2) user attitude.

Introduction

Electronic communication may benefit the learner beyond traditional classroom communication. In a traditional classroom, when class time has ended, discussion ceases. However, with electronic communication, the conversation can continue. The instructor can pose questions or make comments on the discussion to further provoke the student's thought processes. CMC can also be used to increase participation. Zahn et. al. (1999) supported the use of electronic communication, stating that the engaging nature of computer technology enhances communication. Further support of electronic communication is offered by Garner and Gillingham (1999) who followed a high school literature teacher in California. The teacher encouraged his students to use the Internet to tell stories about themselves to age-mates in geographically dispersed classrooms. As one might expect, the "A" students were highly productive, but more importantly, the authors found that six of the students in the most productive group were labeled "at-risk". These students were failing, in danger of failing, disengaged in the classroom, or did not complete written assignments. This finding lends strong support to the idea that electronic communication can not only be used to communicate, but that it might also enhance communication by including those students who would not participate in traditional settings.

While research supports the learning benefit of CMC, a more practical consideration of using CMC is time constraint. With the increasing amount of content being placed on faculty and teacher education students (Handler & Strudler, 1997, ISTE, 2000, NCATE, 1999) the amount of material that needs to be covered cannot always be addressed in the available class time. The use of CMC in conjunction with a traditional classroom setting allows an instructor to introduce a subject or an idea briefly and then discuss the topic in detail outside of class time. Additionally, the instructor can provide guest speakers in an online discussion, which allows students to have access to experts in the field that may allow further student development. Students who utilize a type of CMC in conjunction with an education course are generally satisfied with the results (Johnson & Huff, 2000). Johnson and Huff also reported overall student satisfaction with the discussion group used in their study. The authors found that the use of the discussion group allowed the instructors a means to exchange information with the students and thereby preserve class time for instruction. As a result, the authors strongly recommended CMC as a tool for communication.

Methods

Thirty students from the Elementary and Early Childhood Education (ELED) 259 class at Indiana State University served as participants for the study. This class was selected due to the already existing requirement of electronic communication within the course and the willingness of the professor to involve her students in this research project. As a requirement of the class, students participated in both forms of communication. Students were required to participate in the electronic communication as a part of their course grade, but were given the option of not participating in the survey. Students were randomly assigned into two groups. One group communicated using the email discussion list for six weeks followed by web-based discussion board for six weeks while the second group did the reverse. Following each six-week segment, students completed the Messaging System Survey developed for this study. This survey contained 19 questions regarding user attitude toward CMC. Items were set up in a forced choice Likert-type rating system. The survey also contained demographic questions. Data was analyzed using a repeated measures t-test.

Findings

Results indicate that, when using an email based CMC (M=3.18, SD=.36), students had a significantly more positive attitude about CMC than when they were using a web based CMC (M=2.57, SD=.29), $t(29)=7.16$, $p<.001$. Results further indicate that students will post a significantly greater number of messages when using an email based CMC (M=3.61, SD=2.84) than when using a web-based CMC (M=1.03, SD=.87).

Conclusions

Based on the survey questions, it is clear that students found the email-based discussion to be more convenient, more organized, less time consuming, easier to sort through unwanted mail, and easier to read, respond to, and post messages. Students also indicated on the survey that they were more comfortable using the email based discussion forum. From this study, it is clear that a distinct difference exists between using email-based and web-based CMC. Students definitely have a preference when it comes to CMC and that preference results in more posted messages and a more positive attitude toward CMC. While there was a significant difference between the standard deviation of email-based and web-based CMC, with regard to number of messages posted, a repeated measures t-test is robust to violations of the assumptions when there is a large N.

The research has been unclear regarding if one method of communication is more beneficial than another and if a difference exists, what the contributing factors might be. Clearly, this study has identified that the functional differences between various types of communication, such as method of grouping messages or method of accessing messages, can cause preference of one type of CMC over another.

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The Collaboratory in Your Program

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Abstract:
Learn how to participate in the Collaboratory, a web-based environment educators use to build Internet collaborations, create and engaged learning projects, and communicate. Session participants will also view student contributions to the Collaboratory. Practitioners and future teachers use the Collaboratory to create collaborative classroom projects online.

The Collaboratory Project, http://collaboratory.nunet.net, is a Northwestern University initiative that provides consulting, training, technical support, and information services to K-12 teachers and their students who are interested in using Internet technologies to advance education.

The Collaboratory is an easy-to-use web-based collaborative environment that enables teachers to develop innovative curricular projects in a framework for engaged learning that is activity-based, linked to Illinois Learning Standards, and provides for assessment. It provides a supportive and secure environment that teachers use to meet their specific curricular needs. By removing technical barriers to accomplishing objectives and delivering services, the Collaboratory is making it possible for teachers to successfully carry out significant and meaningful educational activities.

Collaboratory Communication Services include messaging, conferencing, discussion forums, invitations, announcements, instant messaging, and calendars to support collaboration among teachers and students. Automatic alerts and notifications keep participants up-to-date about activities, new projects, and events. Search capabilities enable participants to easily find other people and projects.

Collaboratory Resources provide the scaffolding teachers use to develop innovative curricular projects. These resources include:

- THE CYBRARY, customized, curriculum-specific virtual libraries of Internet resources;
- MEDIASPACE, "electronic multimedia postcards" containing text, graphics, sound, and/or video are used to share projects and information;
- THE INTERNET BOOK CLUB, students share book reviews, compositions and poetry;

  THE SURVEY STUDIO, online surveys, questionnaires, and data collection forms.

Prerequisite participant skills/knowledge required for Collaboratory participants include:

1. Participants must have Internet experience including using email and the internet/web.
2. Participants should have an Internet-connected computer access either in their classroom or sufficient access to their school's computer lab to support the project.

The Collaboratory in Your Classroom eCourse is a no cost online course for educators who want to use the Collaboratory to develop technology enriched, project based learning activities for their students that meet Illinois Learning Standards and Goals. Librarians, media specialists, and technology facilitators who are collaborating with classroom teachers attending the Collaboratory Online Class are encouraged to participate.

Examples of Teacher Created Projects in the Collaboratory

100 Ways to Count the Days (Grade K-2)

This project will provide first grade students with a variety of learning experiences related to counting to one hundred using traditional and technological resources to complete language arts and math activities.

A House Divided - The Election of 1860 (Grade 8)

Students will gather information and report on the presidential election of 1860 and its importance in American History. Their reports may be presented in many different mediums.

Air Quality Chicago (Grade 6-8)

You will investigate the history of environmental laws from 1938 to the present that pertain to air quality and propose new city/state legislation in hopes of curbing air pollution.

Costa Rica through "El Ojo de Agua" (Grade 9-12)

After having read the book "El Ojo de Agua" in class, the Spanish level III students of Warren Township High School will investigate and report on various cultural and geographical aspects of Costa Rica.

Creating A Butterfly Garden (Grade 3-5)

Students will research the butterflies of the Chicagoland region and find out what plants and other needs a garden would require to support a butterfly of their choosing.

Dinosaurs Part 1: Discovering (Grade K-2)

Imagine discovering the bones of a dinosaur that lived millions of years ago! You probably won't make that kind of discovery, but there are other ways of discovering wonderful things.

Kid- made Toys from Around the World (Grade K-6)

Join us as we celebrate children's creativity through the toys they make all over the world! In
this project, students will research, recycle, design, and explain a new toy.

Shape Up Third Grade Geometry (Grade 2-4)

Students will identify and describe plane and solid shapes by their attributes (number of sides, number of edges, corners/vertices).

Steps to Success (Creating Great Science Fair Projects) (Grade 7-8)

This project enables 7th-8th grade students at Jordan Community and Norwood Park Schools to create meaningful science fair projects.

Strike for Bread and Roses - Lawrence Textile Strike of 1912 (Grade 8)

Students will use the story "Strike for Three Loaves" to enhance the study of U.S. Labor History of the early 20th Century. The story involves the issues of labor unions, immigration, child labor, and strikes.

The Rise and Fall of the Aztec Empire (Grade 4-5)

Our 5th-grade students will research the Aztec Empire and create hands-on materials that depict the culture, history, economy and present-day aspects of the Aztec way of life.

Thermodynamics and Heat (Grade 7-12)

Students working in groups of two or three students, third student must me a member of another class, students will explore the concepts associated with heat. Topics to be included in this exploration are, gas laws, specific heat, calorimetry, heat transfer and, the laws of thermodynamics

WTHS Roadkill Study (Grade 7-12)

The Warren Township High School Roadkill Project involves the monitoring by 11th and 12th grade Environmental Science students of a one mile stretch of roadway for roadkills during several two week periods throughout the school year. Monitoring sessions will occur in the Fall, Winter, and Spring.

More specifics about several projects include:

- Shape Up with Third Grade Geometry (3rd grade)
  In the Shape Up with Third Grade Geometry project, teachers and students use the Cybrary to provide web-based math resources for students and teachers. Students learn about geometric shapes by looking at images other students have selected. They identify geometric shapes on their school playground, at the local zoo and in the nearby community. They post their information about shapes in MediaSpace, a place where participants share information through images, text, sounds, and short movies.

- Immigration Studies and Oral History
  In the Immigration Studies and Oral History fourth grade students from around the USA learn about each other by interviewing family members and using real time conferencing and messaging to exchange information about each other. They use a discussion forum to develop group poetry. Students use the Survey Studio to create surveys for collecting family facts and information about social happenings so they can better understand the cultures and customs of their ancestors. They use The Cybrary that their teachers created for Web research. As part of a culminating project, fourth graders recreate or create family shields and do presentations about what the art in the shields represents. The artwork is posted in the MediaSpace, a community for the sharing of information electronically.

- Creating a Butterfly Garden
  The Creating a Butterfly Garden project is designed to teach students about using the Internet, conducting research on the Internet, posting information on the Internet, and working in teams while planning a garden to attract local butterflies. They study these butterflies and post information about them on the Collaboratory to share with their peers. This shared information is in the form of poetry, short stories, pictures, text, sounds, and short movies.

Prerequisite participant skills/knowledge required for Collaboratory participants include:

3. Participants must have Internet experience including using email and the internet/web.
4. Participants should have an Internet-connected computer access either in their classroom or sufficient access to their school's computer lab to support the project.

About the lead presenter:
Bonnie Thurber has worked for The Collaboratory Project, Northwestern University for the past four years. At the Collaboratory she develops programs, facilitates workshops and presents sessions about using the Collaboratory to collaborate and integrate Internet technologies in to the Classroom to educators.

Collaboratory eCourses have been facilitated Winter 2001, Summer 2001, Fall 2001, and Winter 2002. Recent Collaboratory workshops and presentations include:

Presentation at Chicago Learning Technology Center's TLCF Grant Recipient Workshop, Fall 2001.Chicago, IL.

Presentation at World Conference for Computers in Education, Summer 2001.Copenhagen, DK.

The Collaboratory Project Networking Session for eCourse Participants, Northwestern University, Summer 2001. Northwestern University, Evanston, IL.

The Collaboratory Project's Symposium, Spring 2001. Northwestern University, Evanston, IL.

The Collaboratory Project Networking Day for eCourse Participants, Northwestern University, Winter 2001. Northwestern University, Evanston, IL.

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